

What is claimed is:

1. An apparatus for power generation for a marine vessel comprising:
 - a regenerative fuel cell capable of powering said marine vessel independently; and
 - a combustion system combined with said regenerative fuel cell to simultaneously provide power for said marine vessel.
2. The apparatus for power generation for a marine vessel of claim 1, wherein said regenerative fuel cell and said combustion system are combined in a closed-loop.
3. The apparatus for power generation for a marine vessel of claim 2, wherein said combustion system comprises a constant pressure system.
4. The apparatus for power generation for a marine vessel of claim 2, wherein said combustion system comprises a constant volume system.
5. The apparatus for power generation for a marine vessel of claim 4, wherein said constant volume system comprises a Pulse Detonation Engine.
6. The apparatus for power generation for a marine vessel of claim 5, further comprising a hydrogen supply and an oxygen supply, wherein said hydrogen supply and oxygen supply are both in fluid communication with said regenerative fuel cell and said Pulse Detonation Engine.
7. The apparatus for power generation for a marine vessel of claim 6, wherein said regenerative fuel cell uses said hydrogen and oxygen to generate direct current electricity to drive a propulsion system for said marine vessel.
8. The apparatus for power generation for a marine vessel of claim 6, wherein hydrogen from said hydrogen supply and oxygen from said oxygen supply are

injected into said Pulse Detonation Engine to initiate a combustion reaction between said hydrogen and oxygen to provide power for said marine vessel, wherein said combustion reaction forms steam.

9. The apparatus for power generation for a marine vessel of claim 8, wherein said steam is ducted from said Pulse Detonation Engine to a turbine and expanded to rotate a shaft of said turbine.
10. The apparatus for power generation for a marine vessel of claim 9, further comprising a generator that uses said rotating turbine shaft to generate electricity to drive a propulsion system for said marine vessel.
11. The apparatus for power generation for a marine vessel of claim 9, further comprising a gear and clutch system that uses said rotating turbine shaft to turn gear sets of said gear and clutch system to drive a propulsion system for said marine vessel.
12. The apparatus for power generation for a marine vessel of claim 5, wherein said regenerative fuel cell is independently used for driving a propulsion system of said marine vessel when a low power is required, and wherein said regenerative fuel cell and said Pulse Detonation Engine are simultaneously used for driving a propulsion system of said marine vessel when a high power is required.
13. The apparatus for power generation for a marine vessel of claim 9, further comprising a condenser that condenses said steam from said turbine into water, wherein said water is stored in a water supply.

14. The apparatus for power generation for a marine vessel of claim 13, wherein said regenerative fuel cell uses electricity to reduce the water in said water supply into hydrogen and oxygen.
15. The apparatus for power generation for a marine vessel of claim 14, wherein said hydrogen is stored in said hydrogen supply and said oxygen is stored in said oxygen supply.
16. The apparatus for power generation for a marine vessel of claim 5, wherein the Pulse Detonation Engine uses a Deflagration to Detonation transition based system.
17. The apparatus for power generation for a marine vessel of claim 1, wherein said marine vessel is an underwater vessel, which can be either manned or unmanned.
18. A closed-loop system for power generation for a marine vessel comprising:
 - a fuel cell for powering said marine vessel; and
 - a combustion system combined with said fuel cell for powering said marine vessel;wherein said combustion system forms steam as a product of a combustion reaction between hydrogen and oxygen, wherein said steam is converted back into hydrogen and oxygen for re-use by said fuel cell and said combustion system.
19. The closed-loop system for power generation for a marine vessel of claim 18, wherein said fuel cell is a regenerative fuel cell.
20. The closed-loop system for power generation for a marine vessel of claim 19, wherein said combustion system comprises a constant pressure system.

21. The closed-loop system for power generation for a marine vessel of claim 19, wherein said combustion system comprises a constant volume system.
22. The closed-loop system for power generation for a marine vessel of claim 21, wherein said constant volume system comprises a Pulse Detonation Engine.
23. The closed-loop system for power generation for a marine vessel of claim 22, wherein said hydrogen and oxygen are supplied from a hydrogen supply and an oxygen supply, respectively, and wherein said hydrogen supply and oxygen supply are both in fluid communication with said regenerative fuel cell and said Pulse Detonation Engine.
24. The closed-loop system for power generation for a marine vessel of claim 23, wherein said regenerative fuel cell uses said hydrogen and oxygen to generate electricity to drive a propulsion system for said marine vessel.
25. The closed-loop system for power generation for a marine vessel of claim 23, wherein said steam is ducted from said Pulse Detonation Engine to a turbine and expanded to rotate a shaft of said turbine.
26. The closed-loop system for power generation for a marine vessel of claim 25, further comprising a generator that uses said rotating turbine shaft to generate electricity to drive a propulsion system for said marine vessel.
27. The closed-loop system for power generation for a marine vessel of claim 25, further comprising a gear and clutch system that uses said rotating turbine shaft to turn gear sets of said gear and clutch system to drive a propulsion system for said marine vessel.

28. The closed-loop system for power generation for a marine vessel of claim 22, wherein said regenerative fuel cell is used for driving a propulsion system of said marine vessel when a low power is required, and wherein said regenerative fuel cell and said Pulse Detonation Engine are simultaneously used for driving a propulsion system of said marine vessel when a high power is required.
29. The closed-loop system for power generation for a marine vessel of claim 25, further comprising a condenser that condenses said steam from said turbine into water, wherein said water is stored in a water supply.
30. The closed-loop system for power generation for a marine vessel of claim 29, wherein said regenerative fuel cell uses electricity to reduce the water in said water supply into hydrogen and oxygen.
31. The closed-loop system for power generation for a marine vessel of claim 30, wherein said hydrogen is stored in said hydrogen supply and said oxygen is stored in said oxygen supply.
32. The closed-loop system for power generation for a marine vessel of claim 22, wherein the Pulse Detonation Engine uses a Deflagration to Detonation transition based system.
33. The closed-loop system for power generation for a marine vessel of claim 18, wherein said marine vessel is an underwater vessel, which can be either manned or unmanned.
34. A power generation method for a marine vessel, the method comprising:
combining a fuel cell with a combustion system for powering a marine vessel;

initiating a combustion reaction in said combustion system to form steam as a product of said combustion reaction; and

converting said steam back into hydrogen and oxygen for re-use by said fuel cell and said combustion system.

35. The power generation method for a marine vessel of claim 34, wherein said fuel cell and said combustion system are combined in a closed loop with said hydrogen and oxygen.
36. The power generation method for a marine vessel of claim 35, wherein said steam is first condensed into water and then reduced into hydrogen and oxygen.
37. The power generation method for a marine vessel of claim 36, wherein said fuel cell is a regenerative fuel cell.
38. The power generation method for a marine vessel of claim 37, wherein said combustion system comprises a constant pressure system.
39. The power generation method for a marine vessel of claim 37, wherein said combustion system comprises a constant volume system.
40. The power generation method for a marine vessel of claim 39, wherein said constant volume system comprises a Pulse Detonation Engine.
41. The power generation method for a marine vessel of claim 40, wherein said Pulse Detonation Engine uses a Deflagration to Detonation transition based system.
42. The power generation method for a marine vessel of claim 40, wherein said regenerative fuel cell is used to provide power independently to said marine vessel when a low power is required by said marine vessel, while said Pulse Detonation Engine remains idle.

43. The power generation method for a marine vessel of claim 40, wherein said combustion reaction is initiated in said Pulse Detonation Engine to provide power to said marine vessel when a high power is required by said marine vessel.